Cloud Infrastructure Ireland submission to CRU proposed Direction to the System Operators related to Data Centre grid connection consultation

About Cloud Infrastructure Ireland

Cloud Infrastructure Ireland ("CII") is a trade association within Ibec focused on the infrastructure policy issues that affect cloud providers. Ireland's cloud infrastructure enables much of the Irish and global digital economy worth billions and is responsible for tens of thousands of jobs. A thriving cloud infrastructure is vital to Ireland's economic success, as a growing number of businesses locate in regions with well-developed cloud infrastructure. CII seeks partnerships with national and local governments to protect and nurture cloud infrastructure to enhance Ireland's global economic standing.

Introduction

In the "CRU *proposed Direction to the System Operators related to Data Centre grid connection*," consultation (issued June 8, 2021, hereafter, the "consultation"),[1] the Commission for Regulation of Utilities ("CRU") requests views from consumers on the proposed direction outlined in Section 3 of the consultation.

CII recognises and welcomes the efforts made by the CRU to engage with EirGrid and the data centre community to develop a range of measures to ensure that Ireland's decarbonisation goals and security of supply are achieved while supporting economic development. CII welcomes the opportunity to respond to the consultation. Our submission provides background on our industry and our views in relation to the options outlined in the consultation document.

The consultation is an important part of the mechanisms needed to address constraints on the electric grid noted by the consultation and by EirGrid and SONI in the Shaping our Electricity Future Technical Report.[2] To address constraints while maintaining reliability and Ireland's ability to meet the 70% by 2030

---

[1] CRU proposed Direction to the System Operators related to Data Centre gird connection, dated June 8, 2021 (*hereinafter*, the "consultation").

[2] Shaping the Electricity Future, Technical Report, EirGrid Plc and SONI, June 2021 (*hereinafter*, the "Technical Report").

renewable energy targets, it is critical to consider the opportunities for collaboration and the impact hyperscale data centres can have on renewable energy purchasing. A stable planned electricity grid is critical to our sector's ability to grow and thrive in Ireland. Our members have been investing in cloud infrastructure in Ireland for more than a decade and would like to work with the CRU and the system operators to develop a pathway for long term sustained growth.

CII recognises the unique challenges facing security of supply in the constrained areas and consequently, leads CII to encourage the CRU to pursue broad measures capable of immediately marshalling investment and technologies to address security of supply concerns. CII wants to work with CRU, the System Operators and other stakeholders to ensure that the proposed prioritisation framework serves as a temporary solution only. We recognise that investment in infrastructure in constrained regions is needed, and we wish to see that a transition is made to a sustainable, market-based solution that ensures this infrastructure is delivered and paid for through network tariffs that are cost-reflective for large energy users.

Appendix 2 of the Consultation outlines data centre load growth in Ireland without fully contextualising the actions that have led to the current situation. CII recognises the near-term challenges facing the Irish electricity system. This situation is the result of a confluence of issues that have been building over time. While demand for electricity has been growing for the past decade, new deployments of dispatchable large scale generation have been limited and existing generation units have been closed to meet the important goals of climate policy, exacerbating the resource adequacy challenges. Grid planning and new interconnections have been delayed, and key generation units are now unexpectedly offline. In a recently published report ENTSO-E identified the source of the short-term security of supply issues as related to uncommon risks "driven by long-term forced outages of two large CCGT generation units".[3] These circumstances have contributed to the current security of supply crisis. It is also important to note that demand from data centres began arriving on the system more than a decade ago. EirGrid's annual Generation Capacity Statement, released in 2015 (covering 2015-2024), noted that "In the near future, more growth is expected to come from the expanding data centre sector…". Upon review, data centre growth is included in every Generation and Capacity Statement published by EirgGrid from 2015 onwards. While CII recognises that demand from data centres has increased, this growth has been well known by the System Operators for more than half a decade.

CII is ready to work with the CRU and EirGrid to address these near-term challenges. While data centres are singled out as the main contributor of demand growth, other factors such as a growing tech economy prioritising access to low latency data processing, the decarbonisation of transportation, and electrification of home heating will continue to increase electricity demand in Ireland. With this in mind, as well as addressing the grid's short-term challenges, we urge the CRU to work with the system operators and other stakeholders to identify long-term, market-based solutions that will ensure security of supply whilst enabling decarbonisation, economic development and foreign direct investment in Ireland.

Accordingly, CII appreciates this opportunity to submit comments regarding the efficient allocation of grid resources and its approach to soliciting feedback on the future of the data centre connection process. We

---

[3] Summer Outlook 2021, ENTSO-E, (https://eepublicdownloads.entsoe.eu/clean-documents/sdc-documents/seasonal/SOR2021/1_Summer%20Outlook%202021_Report.pdf)

encourage the CRU and other relevant parties in Ireland to continue to seek stakeholder input and feedback, but to do so in a manner that recognises policy uncertainty is a barrier to decarbonisation and broad industry investment.

CII encourages CRU and relevant policy stakeholders to recognise the complex, multi-dimensional infrastructure requirements behind cloud services, which render options to expand outside of the Dublin area to areas across Ireland limited or non-existent for infrastructure serving Dublin-based businesses. Coordination and a holistic approach across relevant policy offices, beyond EirGrid, is essential for maintaining Ireland as an attractive investment destination for the cloud industry. We believe that enabling a market framework which mobilises technology and ongoing investment from the cloud industry, can overcome the challenges outlined in the consultation.

We understand the need for CRU to take steps to respond to concerns raised by the system operators. The consultation document acknowledges that this intervention has been precipitated by immediate concerns regarding security of supply. CII encourages CRU to direct the system operators to treat the connection prioritisation measures for responding to the urgent security supply issues of today as **temporary**. CRU should also direct the system operators to identify long-term, market-based solutions to the challenges of generation adequacy and connection planning that will ultimately replace the proposed extraordinary measures while allowing data centre operators to connect in the same manner as other grid users.

In parallel, CII is seeking a clear statement of policy from the government which will enable our sector to continue to invest in Ireland. The only existing policy document outlining a plan for the cloud infrastructure sector is the Department of Enterprise, Trade and Employment's 2018 *Government Statement on the Role of Data Centres in Ireland's Enterprise Strategy* ("Enterprise Strategy").[4] This document robustly acknowledges our industry's contribution and encourages future investment. In this context, we encourage the CRU to engage with the Department of Enterprise to determine how Ireland's system operators can best facilitate this policy to enable the sector to make future business decisions, particularly in the context of the current grid challenges.

It is critical that CRU, EirGrid and other relevant stakeholders are aligned in the identification of key drivers and solutions for security of supply concerns and that any solutions should support a holistic approach to advanced grid planning and market design, including the items highlighted in these comments. Equally, it is important that any direction provided by the CRU to the system operators does not unfairly single out data centres by differentiating them from other large energy users.

As outlined below, CII supports CRU in pursuing options to support continued investment in Ireland. CII strongly recommends that CRU work with other agencies to resolve the underlying issues noted in the consultation, while allowing for continued economic growth of the data centre and technology industries in Ireland, enabling the transition to 70% renewable energy by 2030 and supporting security of supply.

---

[4] Government Statement on the Role of Data Centres in Ireland's Enterprise Strategy, June 7th, 2018, (https://enterprise.gov.ie/en/Publications/Government-Statement-Data-Centres-Enterprise-Strategy.html)

In the below sections, CII provides context and a response to the questions raised in the consultation. Below is a brief outline of the sections that follow:

1. The importance of the Cloud
2. Response to consultation Section 3.1
3. Response to consultation Section 3.2
4. Response to consultation Section 3.3
5. Additional measures to consider:
    a. Value the cost of holding transmission capacity with rates that pass the cost through to companies that reserve more capacity than they utilise;
    b. Encourage market participation by low carbon flexibility services/service providers;
    c. Reform tariff design to support efficient transmission and resource build-out; and
    d. Apply locational pricing programs that encourage large energy users to develop near available generation.

1. The importance of the Cloud

Ireland is unique in that there are few countries, if any, with such a heavy concentration of companies with incredibly ambitious corporate clean energy and sustainability goals. The cloud industry is a tool for the power industry, and a partner for the CRU, EirGrid, and ESB Networks to drive innovation and a rapid shift to a renewables-centric power system. We have experience and knowledge of practices and policies that have worked well in other jurisdictions, and CII is happy to share our experience and knowledge. Working with EirGrid and the transmission network, the cloud industry in Ireland can be a key partner in supporting new policy with insight and international experience and expertise.

Over the last 16 months - driven by the global pandemic - cloud services became the cornerstone of government, and public services being maintained - in Ireland and elsewhere - and has facilitated the Irish and global economy to work remotely while maintaining social distance. Hyperscale data centre companies represent the platforms on which Ireland and European-based businesses build on to access the digital economy. Increasingly businesses are seeking to locate in regions where they have access to low latency and reliable cloud computing resources needed to achieve sustained growth at scale. For Ireland to maintain its status as one of Europe's leading digital hubs, it is essential that the digital infrastructure needed to deliver cloud services can keep up with growing consumer and business demand by developing in the regions where it is needed.

Cloud computing is the engine that will power the digital economy over the coming decades. Hyperscale data centres provide energy efficient compute, storage, processing, and services for the modern technology driven economy. While cloud computing productivity has grown globally by 550% between 2010 and 2018, energy consumption rose in tandem during the same period by 6% demonstrating the energy efficiency gains of the industry, most notably by hyperscale data centres.[5] Further, the same hyperscale data centre operators are spearheading carbon free energy initiatives, thus supporting the

---

[5] Masanet, Eric; Shehabi; Arman, Lei; Nuoa, Smith, Sarah; Koomey, Jonathan; "Recalibrating global data center energy-use estimates", Sciencemag.org, February 28, 2020, Vol. 367, Issue 6481; ("Expressed as energy use per compute instance, the energy intensity of global datacenters has decreased by 20% annually since 2010….").

clean energy transition.[6] In Ireland, the cloud industry has supported more than 450 MW of added renewable energy capacity through long term Corporate Power Purchase Agreements ("CPPAs") in the past 6 years, supporting Ireland's energy transition. Many of those CPPAs extend for 10-20 years, demonstrating a long-term commitment to supporting Ireland's renewable energy goals and providing proof of a long-term commitment to Ireland.

Data centres deliver benefits far beyond the direct investments made by the businesses that develop them. As an example, companies like AWS, Google, and Microsoft all invested in data centres in Ireland in the early 2000s. Since then, those companies and others have grown their infrastructure, investment, and technical employee base here, making the cloud industry a leading employer and contributor to the Irish economy now and into the future. In 2018, an IDA study found that data centres contributed a total of €7bn in economic activity over the previous seven years and that there are more than 20,000 jobs in the computer, electronics, and optical equipment sectors, which are largely supported by those operating data centre infrastructure here.[7]

Like the investments that EirGrid and ESB Networks have made in the transmission network, the members of CII have invested billions of euros in local communication networks, ocean-spanning fiber cables, and server equipment that make up the physical infrastructure of the cloud. Those investments have enabled industries, governments, universities, and schools to seamlessly make the shift to the cloud in the past year.

As a global centre of excellence for cloud infrastructure, Ireland must mitigate the challenges that come with scale. In Ireland, the capacity and resilience of the power grid is critical given the global infrastructure based here. CII wants to play its part, by working with the CRU and relevant stakeholders to find the right solution to facilitate our sector to grow and thrive while contributing to Ireland's renewable energy goal of 70% by 2030. Already, our members have ambitious global climate targets, which will help Ireland achieve its equally ambitious 2030 goals.

2. **Response to consultation Section 3.1**

We agree with the CRU that action needs to be taken to resolve the transmission constraints and security of supply challenges facing Ireland. CII recognises the unique situation that CRU is balancing. Above all, CII members want to ensure that system reliability is maintained while business operations can continue.

3. **Response to consultation Section 3.2**

A moratorium on processing data centre applications in Dublin is the least desirable of the current options under consideration. This option would remove the potential for data centres to provide grid flexibility and could discourage the type of proactive cooperation that is required to ensure a balance between supply and demand in the constrained areas of the power network.

---

[6] Google: Operating on 24/7 Carbon-Free Energy by 2030, at https://sustainability.google/progress/energy/

[7] idaireland.com/newsroom/publications/ida-ireland-economic-benefits-of-data-centre-inves

CII members have worked closely with EirGrid and ESB Networks to be participatory customers in grid planning and remain ready to collaborate and partner with the system operators on the future of the Irish grid. Electricity, and most importantly, renewable, and carbon-free electricity are a priority for our members. CRU's support for participatory solutions will benefit Ireland by allowing for continued energy efficiency gains in off-premises cloud migration, continued operations of businesses that invest in renewable energy to meet ambitious carbon negative targets,[8] and continued growth of data centres that underlie a technology industry in the country as a platform for innovation.

4.   Response to consultation Section 3.3

In Appendix 1: Proposed Direction Letter to EirGrid PLC and ESBN DAC relating to Data Centre Connections[9] CRU has drafted provisional guidance to the system operators. CRU advises the system operators to prioritise data centre connection applications based on several criteria: location outside of a constrained area; ability to bring dispatchable generations (and/or storage) equal to or greater than demand; ability of data centre applicants to provide flexibility by reducing consumption or dispatching on-site generation when required.

In general, CII members agree with the need for provisional guidance to manage through the current security of supply challenges. However, CII is not supportive of the options for prioritisation provided by the CRU. Additional generation is needed to meet the security of supply challenges, the consultation proposes that data centres should invest in dispatchable generation (e.g., natural gas) to receive new grid connections. CII members are willing to invest in new generation, but we strongly prefer targeting those investments to renewable energy and allowing the auction and market mechanisms to procure necessary balancing, firming and peaking resources from the market.

CII members have invested in new renewable energy in support of Ireland's climate goals and in line with the goal of having 15% of load met by CPPAs by 2030. The first priority for new data centre connections should be linked to enabling investments in new renewable energy, or other clean energy assets which can provide flexibility to the grid. This can help advance Ireland's climate goals, accelerate the pathway to 15% of load being met by CPPAs, reduce renewable energy costs that would be passed on to consumers via the Public Service Obligation, and encourage companies that are committed to sustainability to locate and grow in Ireland. CII strongly recommends that enabling grid investments in new renewable energy or other clean energy resources that can help support grid stability should be the first priority for new data centre connections so that the direction provided to the System Operators is aligned with Ireland's climate goals.

Of the other criteria proposed, CII would recommend that the first, location 'within a constrained region or unconstrained region' should be ranked as a low priority criterion. This would severely restrict investments in expanding existing Dublin-based data centres, at a time when demand for digital services is growing. These data centres should still have the option to grow their existing sites in response to

---

[8] "Corporations purchased a record of 23.7GW of clean energy in 2020, up from 20.1GW in 2019," according to BloombergNEF (BNEF). "Corporate PPA volumes in the Europe, Middle East and Africa (EMEA) region nearly tripled, from 2.6GW in 2019 to a record 7.2GW in 2020." *See* Corporate Clean Energy Buying grew 18% in 2020, Despite Mountain of Adversity *available at* [Corporate Clean Energy Buying Grew 18% in 2020, Despite Mountain of Adversity | BloombergNEF (bnef.com)](#).

[9] *See the consultation at pages 19-23.*

demand from their customers. Closing the door to existing sites by deprioritising constrained regions would be unfair to existing operators and could limit Dublin's ability to respond to growing demand for cloud services. It is also unclear to CII what areas are considered constrained and where available capacity may exist. The CRU should direct the System Operator to publish a map with available capacity to inform stakeholders about areas considered constrained and locations with available capacity. In the short term, such a map can be a static document, over the long term, we recommend that this data be provided online, similar to what has been done by the TSO in the UK.

To assess the additional options provided in the consultation, more information is needed. The consultation provides no clear definition of a constrained area, no detail on the parameters of the 'flexibility' sought (e.g., duration, volume), nor the period of time for which such guidance will apply. These and additional details about the options proposed are needed for stakeholders to understand whether the options are technically feasible, and to provide productive feedback on the consultation. For example, is all of Dublin County constrained? Does the constrained area extend into nearby counties? Will this policy be reversed when capacity reserve margins return to a certain level? If data centres are asked to provide flexibility, in what volume, duration and frequency is such flexibility required? Most importantly, it is unclear how long this direction will remain in place. We request that the CRU provide clear metrics-based targets for when this policy direction will be lifted or amended. Unfortunately, we find it difficult to assess the other options proposed by the Consultation without additional information.

CII strongly cautions the CRU against proposing mechanisms that may inadvertently encourage an increased use of backup diesel generators in exchange for new grid connections. While flexible backup sources may be necessary to address security of supply issues, this practice should not be embedded into a policy that prioritises new connection agreements and, therefore, incentivises this practice as a power supply option to operate a reliable power system in Ireland. This would be short sighted and favor a generation source that would run counter to Ireland's climate plan.

CII recognises that the consultation is asking respondents to prioritise the options outlined in section 3.3. To summarise our position above, we recommend making procurement of renewable energy or other clean energy resources supporting grid stability as the first priority and we recommend that location be the last option. We do not support the other options and cannot offer a perspective on how best to prioritise the options.

Access to a stable power grid and abundant available clean energy is vital to cloud infrastructure for continued growth of the industry. Cloud providers that are developing highly efficient, hyperscale data centres have demonstrated their willingness to be part of the energy solution and applaud CRU for their proactive steps to listen and respond. Beyond options outlined in the consultation, outlined below are policy measures that can support sustainable business growth in the constrained areas and beyond.

5. Additional measures to consider

As noted above, we understand the need for CRU to take steps to respond to concerns raised by the system operators. The consultation document acknowledges that this intervention has been precipitated by immediate concerns regarding security of supply. The lack of available generation capacity to balance demand is an indication of a market in need of a design change. Members of CII recommend that CRU support review and improvement of Capacity Market design to address system needs for security of supply.

To address this fundamental issue, we request that CRU also direct the system operators to identify and implement medium to long-term market-based solutions that will ultimately replace the proposed extraordinary measures while allowing data centre operators to access firm connection capacity in the same manner as other large energy users. CRU can request that System Operators consider the above connection prioritisation measures as temporary, and examine more sustainable solutions to replace them, including those identified below:

   a. **Value the cost of holding transmission capacity with rates that pass the cost through to companies that reserve more capacity than they utilise;**

Transmission constraints are exacerbated by the amount of contracted and requested Maximum Import Capacity ("MIC") on the system and the amount of under-utilised MIC is strong evidence that the current MIC holding costs do not reflect the value to all energy consumers. We welcome the CRU's consideration of tariff revisions that could support efficient transmission build-out and increase firm transmission products while reducing the incentive to hold capacity by appropriately charging the companies that reserve more capacity than they can utilise in the near term. Increasing the MW-assessed transmission charges would disincentivise large energy users from holding MIC or requesting higher connection capacity than their intended use. The tariff design should also factor in whether or not the demand at a particular site is consistently growing, a sign that a higher MIC reservation is warranted. Transmission charging can be designed such that consumers whose demand is not increasing towards their maximum reservation are charged more than those that demonstrate each year that they are growing.

   b. **Encourage market participation by low carbon flexibility services/service providers;**

CRU should support a pathway to correcting the current system issues through improved market design. CRU should seek to broaden the opportunities for data centres and industrial energy users to act as flexibility service providers with low carbon system services. Such opportunities should include pathways to offer long duration storage and smart grid resources into the capacity market. Similarly, the definition of flexibility should be broadened to include cooperative public/private investments in Grid Enhancing Technologies (i.e. advanced power flow control, dynamic line ratings, and topology optimisation).[10]

   c. **Reform tariff design to support efficient transmission and resource build-out;**

A key concern for industry, especially the cloud industry, is the availability of transmission capacity. The cloud industry is highly differentiated across thousands of different products accessible to customers on a global basis. For many cloud operators, including CII members, the infrastructure ready to provide such services is only immediately available in the constrained areas. Power is one of the primary considerations in establishing a data centre campus, but there are many other important infrastructure considerations, e.g., fiber network, interconnections, etc. Like EirGrid's network of transmission lines and substations, the infrastructure underpinning the cloud is not easily moved. For existing data centre networks, future growth is geographically tied to the existing network. Instead of capping the future growth, we believe that the CRU could use network tariff design to provide a firm capacity option whilst leveraging large energy users to fund additional investment in constrained areas, thereby reducing the infrastructure costs to other consumers.

---

[10] EirGrid Partners with Smart Wires on Groundbreaking Grid Project, https://www.smartwires.com/2021/07/01/eirgrid-partners-with-smart-wires/

Additionally, CII supports a reform to Eirgrid's tariffs that would pass-through the infrastructure costs of service to the companies which require additional Maximum Import Capacity (MIC). By reforming their tariff design, Eirgrid could enable near-term transmission infrastructure growth and generation assets needed in constrained regions and ensure that the contribution made by the large energy users that will depend on them is cost-reflective. This approach would complement the development of offshore wind generation, which predominantly will be based in the Dublin region/close to major cities.

      d. Apply locational pricing programs that encourage large energy users to develop near available generation;

The consultation proposes offering grid connections to data centres based on their location. Instead, CII would support the examination of a price-based mechanism for grid access and MIC to deliver the same goal this measure seeks to achieve. One option to limit growth in constrained areas is to support EirGrid in instituting location-specific pricing reflective of transmission infrastructure costs. Congestion products should also be considered and included in new market design offerings.

In response to EirGrid's recent consultation on Shaping our Electricity Future, CII encouraged the creation of locational pricing or other market signals that encourage large energy users to develop near available generation. Such reforms should be implemented with safeguards to ensure that locational pricing does not result in significant cost increases for all customers in congested regions who cannot easily relocate. However, we appreciate that this may take longer to implement given the absence of any market or product design in place for congestion. CII welcomes the opportunity to engage in a dialogue on the future development of such a pricing structure.

CII stands ready to support and inform the design of these charges and create market signals that will be meaningful to our members. This solution will take time to implement and will rely on consumers having access to transparent information on availability of capacity in the network.

Conclusion

CII thanks the CRU for putting forth the consultation and requesting stakeholder feedback. As large energy users, customers and buyers of renewable energy, and innovative solution providers the future of the Irish grid is important for our business growth and investment. Addressing the near-term grid challenges facing Ireland and enabling a power system that can support long-term growth and investment is of great importance to our members. We strongly support creating a plan that ensures meeting Ireland's 70% by 2030 targets, provides reliability for all customers, enables continued economic growth, leverages market-signals to drive customer action, can be delivered quickly and efficiently, and prioritises carbon-free and renewable energy. We stand ready to work with the CRU, EirGrid, ESB Networks and other stakeholders to achieve our shared goals.